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January 28, 2008

Patent Appeal Center
Commissioner for Patents
P. O. Box 1450
Alexandria, VA 22313-1450

Attn: Tracey Young
Patent Appeals Specialist

Re: U.S. Patent Application No.: 10/792,018
CPICH PROCESSING FOR SINR ESTIMATION TO W-CDMA SYSTEM
Filed: March 2, 2004
Our File: 944-005.027

Dear Ms. Young:

We received your Notice of Non-Compliant Appeal Brief which was mailed January 16, 2008, thank you.

We have corrected the Brief of Appellants by adding to the Status of Claims section, a reference to all claims.

Please get back to us if anything further is needed. Thank you.

Very truly yours,

Kenneth Q. Lao

KQL/mef
Enc.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of: **LAMPINEN, el al**

Application No.: **10/792,018** Group No.: **2611**

Filed: **March 2, 2004** Examiner: **Kevin Michael Burd**

For: **CPICH PROCESSING FOR SINR ESTIMATION IN W-CDMA SYSTEM**

Mail Stop Appeal Brief - Patents
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

BRIEF OF APPELLANTS (37 CFR §41.37)

Sir:

This is a corrected appeal from the final rejection contained in a Final Office Action mailed on July 20, 2007 (the "Final Office Action"), rejecting claims 3-7, 9-12, 14-18 and 20-25.

******If any fee and/or extension is required in addition to any enclosed herewith, please charge Account No. 23-0442.***

CERTIFICATE OF MAILING/TRANSMISSION (37 C.F.R. § 1.8(a))

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Marie E. Forte

Signature

Date: Jan 28, 2008

Marie E. Forte

(type or print name of person certifying)

I. REAL PARTY IN INTEREST (37 CFR §41.37(c)(1)(i))

The real party in interest in this action is Nokia Corporation, Keilalahdentie 4, FIN-02150 Espoo, Finland, by virtue of the Assignment dated November 10 and 14, 2003. The Assignment was recorded in the U.S. Patent and Trademark Office on February 9, 2004.

II. RELATED APPEALS AND INTERFERENCES (37 CFR §41.37(c)(1)(ii))

There are no related appeals or interferences.

III. STATUS OF CLAIMS (37 CFR§41.37(c)(1)(iii))

The status of the claims is:

Claims canceled: 1, 2, 8, 13 and 19.

Claims pending: 3-7, 9-12, 14-18 and 20-25.

Claims objected to: none.

Claims rejected: 3-7, 9-12, 14-18 and 20-25.

Claims on appeal: 3-7, 9-12, 14-18 and 20-25.

IV. STATUS OF AMENDMENTS (37 CFR §41.37(c)(1)(iv))

No amendment as to claims 3-7, 9-12, 14-18 and 20-25 has been filed subsequent to final rejection.

V. SUMMARY OF CLAIMED SUBJECT MATTER (37 CFR §41.37(c)(1)(v))

Appellant's invention is directed to a method and system for estimating the signal to signal-to-interference plus noise ratio of the common pilot channel in a wideband code-division multiple access receiver. The ratio estimation is carried out after chip leel filtering and then the despreading of the common pilot channel. In particular, space-time transmit diversity is used in the transmission of signals and the power from each of the transmit antennas is combined for obtaining the received common pilot channel. See page 6, lines 13 to 23.

The invention of claim 3 is directed to a method for estimating the signal-to-inteference ratio in a receiver having an equalization stage for chip level filtering of received chip. The method includes the following steps:

1. Despreading a common pilot channel in a spread-spectrum receiver adapted to receive a signal stream in space-time diversity transmission, wherein the despreading is carried out after the chip level filtering (page 6, lines 6-9); and
2. Estimating the signal-to-interference ratio from the despread common pilot channel symbols (page 6, lines 9-12).

The invention of dependent claim 4 is directed to the method in which a virtual space-time decoding is used on the common pilot channel in order to mimic data channel space-time transformation (page 9, lines 8-10).

The invention of dependent claim 5 is directed to the method in which the received chips are oversampled at chip-level (page 7, lines 6-9).

The invention of claim 6 is directed to a receiver, which includes:

1. An equalization stage for chip level filtering received chips, wherein the received chips are obtained from a signal stream in space-time transmit diversity transmission;
2. A despreading module for despreading a common pilot channel after said chip level filtering; and
3. An estimation module for estimating signal-to-interference ratio at least partially from despread common pilot channel symbols. *See* Figure 2.

The invention of dependent claim 7 is directed to the receiver wherein the estimated signal-to-interference ratio is for use by a user equipment in the communications system to report its channel quality indicator (page 1, lines 19-26).

The invention of dependent claim 9 is directed to the receiver in a communications system having a transmitter with space-time transmit diversity transmission (Figure 2; page 6, lines 13-21).

The invention of dependent claim 10 is directed to the receiver in the communications system wherein the received chips are over-sampled at chip level (page 7, lines 6-9).

The invention of claim 11 is directed to a spread-spectrum communications system, which includes:

a receiver; and

a transmitter for transmitting a signal stream in space-time transmit diversity transmission to the receiver, the signal stream containing a chip stream in a common pilot channel, wherein the receiver has at least one antenna to receive one or more chips in the chip stream; wherein the receiver includes:

an equalization stage for chip level filtering the received chips;

a despreading module for despreading the common pilot channel after said chip level filtering; and

an estimation module for estimating signal-to-interference ratio at least partially from despread common pilot channel symbols. See Figure 2 and page 6, lines 13-21.

The invention of dependent claim 12 is directed to the communications system in which the estimated signal-to-interference ratio is for use by a user equipment in the communications system to report its channel quality indicator (page 1, lines 19-26).

The invention of dependent claim 14 is directed to the communications system in which the transmitter has two or more antennas for transmitting the signal stream in order to achieve space-time transmit diversity (Figure 2; page 6, lines 13-21).

The invention of dependent claim 15 is directed to the communications system in which the received chips are over-sampled at chip level (page 7, lines 6-9).

The invention of dependent claims 16 is directed to the communications system wherein a virtual space-time decoding in the receiver is used on the common pilot channel in order to mimic data channel space-time transformation (page 9, lines 8-10).

The invention of claim 17 is directed to a communications device in a communications system. The device includes:

an antenna; and

a receiver, operatively connected to the antenna, for receiving communication signals in space-time transmit diversity transmission, wherein the communication signals include a transmitted signal indicative of one or more chips in a chip stream in a common pilot channel; and wherein the received signals include received chips, the receiver including:

an equalization stage for chip level filtering received chips;

a despreading module for despreading a common pilot channel after said chip level filtering; and

an estimation module for estimating signal-to-interference ratio at least partially from despread symbols (Figure 2; page 6, lines 13-21).

The invention of dependent claim 18 is directed to the communications device in which the estimated signal-to-interference ratio is used for reporting a channel quality indicator to another component in the communication system (page 1, lines 19-26).

The invention of dependent claim 20 is directed to the communications device in which the communications signals are transmitted from a transmitter having two or more antennas for transmitting the signal stream in order to achieve the space-time transmit diversity transmission (Figure 2; page 6, lines 13-21).

The invention of dependent claim 21 is directed to the communication device including a mobile terminal (page 10, lines 1-6).

The invention of dependent claim 22 is directed to the communications system including a wideband code division multiple access communications system (page 9, lines 27-28).

The invention of dependent claim 23 is directed to the method in which the spread-spectrum receiver comprises a wideband code division multiple access receiver (page 9, lines 24-27).

The invention of claim 24 is directed to a spread-spectrum communications system, which includes:

a receiver; and

means for transmitting a signal stream to the receiver in space-time transmit diversity transmission, the signal stream containing a chip stream in a common pilot channel, wherein the receiver has at least one antenna to receive one or more chips in the chip stream; the receiver further including:

means for chip level filtering the received chips;

means for despreading the common pilot channel after said chip level filtering; and

means for estimating signal-to-interference ratio at least partially from despread common pilot channel symbols (Figure 2; page 6, lines 13-21).

The invention of dependent claim 25 is directed to a communications system in which the estimated signal-to-interference ratio is for use by a user equipment in the communications system to report its channel quality indicator (page 1, lines 19-26).

VI. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL (37 CFR §41.37(c)(1)(vi))

Claims 3-7, 9-12, 14-18 and 20-25 are rejected under 35 U.S.C. 103(a) as being unpatentable over *Petre et al.* (U.S. Patent No. 7,158,558), in view of *Onggosanusi et al.* (U.S. Patent Application Publication No. 2002/0196842, *Onggosanusi*).

VII. ARGUMENT (37 CFR §41.37(c)(1)(vii))

At section 3, claims 3-7, 9-12, 14-18 and 20-25 are rejected under 35 U.S.C. 103(a) as being unpatentable over *Petre et al.* (U.S. Patent No. 7,158,558, hereafter referred to as *Petre*), in view of *Onggosanusi et al.* (U.S. Patent Application Publication No. 2002/0196842, hereafter referred to as *Onggosanusi*).

(A) Claim 3

The invention as claimed in independent claim 3 includes the limitation of despreading a Common Pilot Channel in a spread-spectrum receiver, wherein the spread-spectrum receiver is adapted to receive a signal stream in space-time diversity transmission.

In rejecting claim 3, the Examiner states that *Petre* discloses a method of communication using a common pilot channel (CPICH) in a W-CDMA receiver which receives the CPICH. The signal is equalized using chip level equalization and the equalized CPICH channel is despread. The Examiner admits that *Petre* fails to disclose estimating SINR from the despread CPICH, but points to *Onggosanusi* for disclosing that feature.

The Examiner states that *Onggosanusi* discloses estimating the signal-to-interference ratio (SINR) from the despread CPICH. The Examiner also states that *Onggosanusi* discloses that the transmitter comprises multiple antennas (Figure 3 and paragraph [0049]). The Examiner is **silent** on whether *Onggosanusi* discloses the signal stream is the form for space-time transmit diversity transmission.

While it is true that *Onggosanusi* discloses a communications system having a number of transmit antennas as shown in Figures 1 to 4, the multiple transmit antenna system is used in a multi-input multi-output (MIMO) system. (see paragraphs [0008], [0009], [0013], [0016], [0049], [0062]). In one of the embodiments, *Onggosanusi* uses four transmit antennas TAT"$_1$ to TAT"$_4$ and a larger number of receive antennas RAT"$_1$ to RAT"$_Q$ (Q>4) in a MIMO system with double space-time block coded transmit antenna diversity (DSTTD). In this DSTTD system, *Onggosanusi* uses two STTD encoders to combine information multiplexing with transmit diversity MIMO.

It is respectfully submitted that a signal transmitted in a DSTTD system is **different** from a signal stream in the space-time transmit diversity transmission, because a DSTTD system applies information multiplexing into two STTD blocks. For example, one of the STTD blocks transmits symbols $S_{1,1}$ and $S_{1,2}$ and the other STTD block transmits symbols $S_{2,1}$ and $S_{2,2}$ (see paragraph [0083]) The spatially parallel transmission causes additional interference. This interference would not be correctly taken into account by the claimed pilot processing for the space-time transmit diversity transmission scheme. Thus, the DSTTD scheme in *Onggosanusi* is not applicable for space-time transmit diversity transmission. Likewise, the claimed invention is not applicable for the DSTTD transmission.

Petre does not disclose that the signal stream is in the form for space-time transmit diversity transmission. *Onggosanusi* does not disclose that the signal stream is in the form for space-time transmit diversity transmission.

For the above reasons, *Petre*, in view of *Onggosanusi*, fails to render claim 3 obvious.

(B) Claim 6

The invention as claimed in independent claim 6 includes the limitation of an equalization stage for chip level filtering the received chips, wherein the received chips are obtained from a signal stream in space-time diversity transmission.

In rejecting claim 6, the Examiner states that *Petre* discloses a method of communication using a common pilot channel (CPICH) in a W-CDMA receiver which receives the CPICH. The signal is equalized using chip level equalization and the equalized CPICH channel is despread. The Examiner admits that *Petre* fails to disclose estimating SINR from the despread CPICH, but points to *Onggosanusi* for disclosing that feature.

The Examiner states that *Onggosanusi* discloses estimating the signal-to-interference ratio (SINR) from the despread CPICH. The Examiner also states that *Onggosanusi* discloses that the transmitter comprises multiple antennas (Figure 3 and paragraph [0049]). The Examiner is **silent** on whether *Onggosanusi* discloses the signal stream is the form for space-time transmit diversity transmission.

As explained in sub-section B above, a signal transmitted in a DSTTD system is **different** from a signal stream in the space-time transmit diversity transmission, because a DSTTD system applies information multiplexing into two STTD blocks. The DSTTD scheme in *Onggosanusi* is not applicable for space-time transmit diversity transmission. Likewise, the claimed invention is not applicable for the DSTTD transmission.

Petre does not disclose that the signal stream is in the form for space-time transmit diversity transmission. *Onggosanusi* does not disclose that the signal stream is in the form for space-time transmit diversity transmission.

For the above reasons, *Petre*, in view of *Onggosanusi*, fails to render claim 6 obvious.

(C) Claim 11

The invention as claimed in independent claim 11 has the limitation of a transmitter for transmitting a signal stream in space-time transmit diversity transmission to a receiver.

In rejecting claim 11, the Examiner states that *Petre* discloses a method of communication using a common pilot channel (CPICH) in a W-CDMA receiver which receives the CPICH. The signal is equalized using chip level equalization and the equalized CPICH channel is despread. The Examiner admits that *Petre* fails to disclose estimating SINR from the despread CPICH, but points to *Onggosanusi* for disclosing that feature.

The Examiner states that *Onggosanusi* discloses estimating the signal-to-interference ratio (SINR) from the despread CPICH. The Examiner also states that *Onggosanusi* discloses that the transmitter comprises multiple antennas (Figure 3 and paragraph [0049]). The Examiner is **silent** on whether *Onggosanusi* discloses the signal stream is the form for space-time transmit diversity transmission.

As explained in sub-section B above, a signal transmitted in a DSTTD system is **different** from a signal stream in the space-time transmit diversity transmission, because a DSTTD system applies information multiplexing into two STTD blocks. The DSTTD scheme in *Onggosanusi* is not applicable for space-time transmit diversity transmission. Likewise, the claimed invention is not applicable for the DSTTD transmission.

Petre does not disclose that the signal stream is in the form for space-time transmit diversity transmission. *Onggosanusi* does not disclose that the signal stream is in the form for space-time transmit diversity transmission.

For the above reasons, *Petre*, in view of *Onggosanusi*, fails to render claim 11 obvious.

(D) Claim 17

The invention as claimed in independent claim 17 has the limitation of a receiver for receiving communication signals in space-time diversity transmission.

In rejecting claim 17, the Examiner states that *Petre* discloses a method of communication using a common pilot channel (CPICH) in a W-CDMA receiver which receives the CPICH. The signal is equalized using chip level equalization and the equalized CPICH channel is despread. The Examiner admits that *Petre* fails to disclose estimating SINR from the despread CPICH, but points to *Onggosanusi* for disclosing that feature.

The Examiner states that *Onggosanusi* discloses estimating the signal-to-interference ratio (SINR) from the despread CPICH. The Examiner also states that *Onggosanusi* discloses that the transmitter comprises multiple antennas (Figure 3 and paragraph [0049]). The Examiner is **silent** on whether *Onggosanusi* discloses the signal stream is the form for space-time transmit diversity transmission.

As explained in sub-section B above, a signal transmitted in a DSTTD system is **different** from a signal stream in the space-time transmit diversity transmission, because a DSTTD system applies information multiplexing into two STTD blocks. The DSTTD scheme in *Onggosanusi* is not applicable for space-time transmit diversity transmission. Likewise, the claimed invention is not applicable for the DSTTD transmission.

Petre does not disclose that the signal stream is in the form for space-time transmit diversity transmission. *Onggosanusi* does not disclose that the signal stream is in the form for space-time transmit diversity transmission.

For the above reasons, *Petre*, in view of *Onggosanusi*, fails to render claim 17 obvious.

(E) Claim 24

The invention as claimed in independent claim 24 has the limitation of having means for transmitting a signal stream to a receiver in space-time diversity transmission.

In rejecting claim 24, the Examiner states that *Petre* discloses a method of communication using a common pilot channel (CPICH) in a W-CDMA receiver which receives the CPICH. The signal is equalized using chip level equalization and the equalized CPICH channel is despread. The Examiner admits that *Petre* fails to disclose estimating SINR from the despread CPICH, but points to *Onggosanusi* for disclosing that feature.

The Examiner states that *Onggosanusi* discloses estimating the signal-to-interference ratio (SINR) from the despread CPICH. The Examiner also states that *Onggosanusi* discloses that the transmitter comprises multiple antennas (Figure 3 and paragraph [0049]). The Examiner is **silent** on whether *Onggosanusi* discloses the signal stream is the form for space-time transmit diversity transmission.

As explained in sub-section B above, a signal transmitted in a DSTTD system is **different** from a signal stream in the space-time transmit diversity transmission, because a DSTTD system applies information multiplexing into two STTD blocks. The DSTTD scheme in *Onggosanusi* is not applicable for space-time transmit diversity transmission. Likewise, the claimed invention is not applicable for the DSTTD transmission.

Petre does not disclose that the signal stream is in the form for space-time transmit diversity transmission. *Onggosanusi* does not disclose that the signal stream is in the form for space-time transmit diversity transmission.

For the above reasons, *Petre*, in view of *Onggosanusi*, fails to render claim 24. obvious.

(F) Claims 4 and 16

The invention of claims 4 and 16 has the further limitation of using a virtual space-time decoding used on the CPICH channel in order to mimic data channel space-time transformation.

In rejecting claims 4 and 16, the Examiner states that the combination of the channel and receiver's chip level filtering at the equalizer can be seen as a virtual channel.

It is respectfully submitted that claims 4 and 16 are dependent from claims 3 and 11 and recite features not recited in claims 3 and 11. For reasons regarding claims 3 and 11 above, *Petre*, in view of *Onggosanusi*, also fails to render claims 4 and 16 obvious.

(G) Claims 5, 10 and 15

The invention as claimed in claims 5, 10 and 15 has the limitation that the received chips are over-sampled at chip level.

In rejecting claims 5, 10 and 15, the Examiner states that the combination of the teachings in *Petre* and *Onggosanusi* discloses that received chips are oversampled at chip-level.

It is respectfully submitted that claims 5, 10 and 15 are dependent from claims 3, 6 and 11 and recite features not recited in claims 3, 6 and 11. For reasons regarding claims 3, 6 and 11 above, *Petre*, in view of *Onggosanusi*, also fails to render claims 5, 10 and 15 obvious.

(H) Claim 21

The invention of claim 21 has the limitation that the receiver includes a mobile terminal.

In rejecting claim 21, the Examiner states that the receiver is in a mobile terminal.

It is respectfully submitted that claim 21 is dependent from claim 17 and recites features not recited in claim 21. For reasons regarding claim 21 above, *Petre*, in view of *Onggosanusi*, also fails to render claim 21 obvious.

(I) Claims 7, 9, 12, 14, 18, 20, 21, 22, 23 and 25

The Examiner rejects claims 7, 9, 12, 14, 18, 20, 21, 22, 23 and 25 on the same grounds as used in rejecting claims 3, 6, 11, 17 and 24.

It is respectfully submitted that claims 7, 9, 12, 14, 18, 20, 21, 22, 23 and 25 are dependent from claims 3, 6, 11, 17 and 24 and recite features not recited in claims 3, 6,

11, 17 and 24. For reasons regarding claims 3, 6, 11, 17 and 24 above, *Petre*, in view of *Onggosanusi*, also fails to render claims 7, 9, 12, 14, 18, 20, 21, 22, 23 and 25 obvious.

VIII CLAIMS APPENDIX (37 CFR §41.37(c)(1)(viii))

3. A method, comprising:

despreading a Common Pilot Channel (CPICH) channel in a spread-spectrum receiver, wherein the spread-spectrum receiver is adapted to receive a signal stream in space-time diversity transmission and the receiver comprises an equalization stage for chip level filtering of received chip, and wherein said despreading is carried out after said chip level filtering; and

estimating the signal to interference ratio at least partially from despread CPICH symbols.

4. A method according to claim 3, wherein a virtual space-time decoding is used on the CPICH channel in order to mimic data channel space-time transformation

5. A method according to claim 3, wherein the received chips are oversampled at chip-level.

6. A receiver, comprising:

an equalization stage for chip level filtering received chips, wherein the received chips are obtained from a signal stream in space-time transmit diversity transmission;

a despreading module for despreading a common pilot channel (CPICH) after said chip level filtering; and

an estimation module for estimating signal-to-interference ratio at least partially from despread CPICH symbols.

7. A receiver according to claim 6, wherein the estimated signal-to-interference ratio is for use by a user equipment in the communications system to report its channel quality indicator (CQI).

9. A receiver according to claim 6, wherein the communications system comprises a transmitter with space-time transmit diversity transmission.

10. A receiver according to claim 9, wherein the received chips are over-sampled at chip level.

11. A spread-spectrum communications system comprising:

a receiver; and

a transmitter for transmitting a signal stream in space-time transmit diversity transmission to the receiver, the signal stream containing a chip stream in a common pilot channel (CPICH), wherein the receiver has at least one antenna to receive one or more chips in the chip stream; the receiver further comprising:

an equalization stage for chip level filtering the received chips;

a despreading module for despreading the common pilot channel after said chip level filtering; and

an estimation module for estimating signal-to-interference ratio at least partially from despread CPICH symbols.

12. A communications system according to claim 11, wherein the estimated signal-to-interference ratio is for use by a user equipment in the communications system to report its channel quality indicator (CQI).

14. A communications system according to claim 11, wherein the transmitter has two or more antennas for transmitting the signal stream in order to achieve space-time transmit diversity.

15. A communications system according to claim 14, wherein the received chips are over-sampled at chip level.

16. A communications system according to claim 14, wherein a virtual space-time decoding in the receiver is used on the CPICH in order to mimic data channel space-time transformation.

17. A communications device in a communications system, comprising:

an antenna; and

a receiver, operatively connected to the antenna, for receiving communication signals in space-time transmit diversity transmission, wherein the communication signals include a transmitted signal indicative of one or more chips in a chip stream in a common pilot channel (CPICH); and wherein the received signals include received chips, the receiver comprising:

an equalization stage for chip level filtering received chips;

a despreading module for despreading a common pilot channel (CPICH) after said chip level filtering; and

an estimation module for estimating signal-to-interference ratio at least partially from despread CPICH symbols.

18. A communications device according to claim 17, wherein the estimated signal-to-interference ratio is used for reporting a channel quality indicator (CQI) to another component in the communication system.

20. A communications device according to claim 17, wherein the communications signals are transmitted from a transmitter having two or more antennas for transmitting the signal stream in order to achieve the space-time transmit diversity transmission.

21. A communications device according to claim 17, comprising a mobile terminal.

22. A communications system according to claim 11, comprising a W-CDMA communications system.

23. A method according to claim 3, wherein the spread-spectrum receiver comprises a W-CDMA receiver.

24. A spread-spectrum communications system comprising:

a receiver; and

means for transmitting a signal stream to the receiver in space-time transmit diversity transmission, the signal stream containing a chip stream in a common pilot channel (CPICH), wherein the receiver has at least one antenna to receive one or more chips in the chip stream; the receiver further comprising:

means for chip level filtering the received chips;

means for despreading the common pilot channel after said chip level filtering; and

means for estimating signal-to-interference ratio at least partially from despread CPICH symbols.

25. A communications system according to claim 24, wherein the estimated signal-to-interference ratio is for use by a user equipment in the communications system to report its channel quality indicator (CQI).

IX. EVIDENCE APPENDIX (37 CFR §41.37(c)(1)(ix))

There are no evidences submitted pursuant to 37 CFR §1.130, 1,131 or 1,132.

X. RELATED PROCEEDING APPENDIX (37 CFR §41.37(c)(1)(x))

There are no prior decisions rendered by a court or the Board in any proceeding identified pursuant to 37 CFR §41.37(c)(1)(ii).

CONCLUSION

It is respectfully submitted that the present invention as claimed is readily distinguishable over the cited references.

Respectfully submitted,

Date: January 28, 2008

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